

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
23 December 2004 (23.12.2004)

PCT

(10) International Publication Number
WO 2004/111730 A3

(51) International Patent Classification⁷: **G03F 7/32**

(21) International Application Number:
PCT/JP2004/008508

(22) International Filing Date: 10 June 2004 (10.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003-169834 13 June 2003 (13.06.2003) JP

(71) Applicant (for all designated States except US): **TOKYO OHKA KOGYO CO., LTD.** [JP/JP]; 150, Nakamaruko, Nakahara-ku, Kawasaki-shi, Kanagawa, 211-0012 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WASHIO, Yasushi** [JP/JP]; c/o 150, Nakamaruko, Nakahara-ku, Kawasaki-shi, Kanagawa, 211-0012 (JP). **SAITO, Koji** [JP/JP]; c/o 150, Nakamaruko, Nakahara-ku, Kawasaki-shi, Kanagawa, 211-0012 (JP).

(74) Agents: **TANAI, Sumio et al.**; 2-3-1, Yaesu, Chuo-ku, Tokyo 104-8453 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

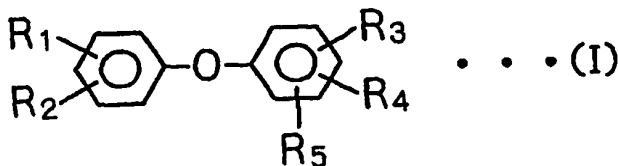
- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
18 August 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/111730 A3

(54) Title: DEVELOPER COMPOSITION FOR RESISTS AND METHOD FOR FORMATION OF RESIST PATTERN



formula, at least one of R₁ and R₂ represents an alkyl or alkoxy group having 5 to 18 carbon atoms and the other one represents a hydrogen atom, or an alkyl or alkoxy group having 5 to 18 carbon atoms, and at least one of R₃, R₄ and R₅ represents an ammonium sulfonate group or a sulfonic acid-substituted ammonium group and the others represent a hydrogen atom, an ammonium sulfonate group or a sulfonic acid-substituted ammonium group.

(57) Abstract: To provide a developer composition for resists, capable of improving dimensional controllability of a resist pattern. The developer composition for resists comprises an organic quaternary ammonium base as a main component, said developer composition further comprising an anionic surfactant represented by the following general formula (I), and SO₄²⁻ the content of SO₄²⁻ being from 0.01 to 1% by mass. Formula (I). In the

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G03F7/32 G03F7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 985 525 A (SATO ET AL) 16 November 1999 (1999-11-16) claim 1; examples 1,16	1-4
A	PATENT ABSTRACTS OF JAPAN vol. 016, no. 540 (P-1450), 10 November 1992 (1992-11-10) - & JP 04 204454 A (TOKYO OHKA KOGYO CO LTD), 24 July 1992 (1992-07-24) cited in the application abstract	1-4
A	US 5 543 268 A (TANAKA ET AL) 6 August 1996 (1996-08-06) the whole document	1-4
A	US 5 300 404 A (TANI ET AL) 5 April 1994 (1994-04-05) column 4, line 23 - line 37	1-4

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the International search

13 June 2005

Date of mailing of the International search report

15/07/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Heywood, C

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5985525	A	16-11-1999	JP	3104939 B2	30-10-2000
			JP	6118660 A	28-04-1994
JP 04204454	A	24-07-1992	JP	2589408 B2	12-03-1997
US 5543268	A	06-08-1996	US	6329126 B1	11-12-2001
US 5300404	A	05-04-1994	JP	2712700 B2	16-02-1998
			JP	3223867 A	02-10-1991